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IDENTIFIERS	*Florida; Secretarys Comm on Achieving Necessary Skills

ABSTRACT

This document consists of 48 audiovisual aids and information sheets pertaining to technology education (TE) that were used in a presentation to Florida's External Committee on Curriculum Restructuring in Vocational Education. The following are among the topics covered: recent developments in/regarding TE in Florida; factors influencing TE in Florida; goals/objectives of TE as a new basic in Florida; TE's history, evolution, and paradigm shift; Florida's high-technology triangle and technology strengths; major characteristics of U.S. society; stakeholder/research/professional/consensus groups in TE; educational reports/initiatives/legislation/projects influencing TE; similarities of the goals/content of TE to those proposed by the Secretary's Commission on Achieving Necessary Skills; nature/scope of technology, TE, and technological literacy; major differences between industrial arts and TE and science and technology; a universal systems model; problem solving; goals/career paths for TE students at the elementary, middle, and high school levels; TE programs in 1993-1994 and 1994-1995; TE program changes slated for 1995-1998; core outcomes; TE issues and concerns; TE plans; generic technology competencies for TE instruction; TE's level of integration; a TE curriculum framework; joint TE/science laboratories; and suggested facilities for integrated studies in TE and science. (MN)

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ED 377 358

TECHNOLOGY EDUCATION THE NEW BASIC

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William D. Wargo
Bob Caldwell

MEMORANDUM

TO: Selected Persons Interested in Technology Education
FROM: Bill Wargo, Program Director for Technology Education
SUBJECT: VISUALS ON TECHNOLOGY EDUCATION
DATE: July 18, 1994

This booklet, Technology Education: The New Basic On Target for Florida Students, is a compilation of visuals and information that was used in a presentation to the "External Committee on Curriculum Restructuring in Vocational Education." Since several individuals have expressed a general interest in having these materials, this collection was formed for your use in any way that may be helpful in communicating about Technology Education for staff development and other purposes.

Specific instructions are not included about how these visuals have been or could be used. In most cases it is probably evident. We hope that you will find them to be helpful.

If you have questions about any of the visuals please feel free to call Bob Caldwell or me at (904) 488-0400.

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TECHNOLOGY EDUCATION

Activity and planning have been on-going to bring about changes in Technology Education programs in consultation with the Technical Committee, supervisors, teachers and Vocational Directors. Plans to strengthen Technology Education include phasing in 5 restructured, rigorous grade 6-12 programs between 1993-1995 and phasing out 26 existing grade 6-12 programs between 1994-1998.

A new program is under development for grade 6 titled tentatively "World of Technology," and plans are being considered to develop activities for Grades K-5.

As a result of Technology Education planning, the 1993 legislature appropriated $10.8 million in specific appropriation 1953A "to assist school districts with conversion of Industrial Arts laboratories in senior, middle and junior high schools to Technology Education laboratories" by mean of updating equipment and instructional programs. Funds were awarded through the RFP process to 86 schools in 47 districts. The equipment acquired will enhance the Blueprint for Career Preparation activities.

Plans to upgrade Technology Education and Science laboratory facilities have been significantly assisted by specific appropriation 1949 of SB 1800. An appropriated amount of 25 million dollars "to upgrade, expand, remodel or renovate science and Technology Education laboratories in senior, junior and middle schools." A request for proposals to utilize these funds has resulted in the receipt of 130 proposals from 43 districts to participate in the funds. 92 sites were awarded funds.

The 1994 Legislature provided 10 million dollars in specific appropriation 2008A to be "expended to upgrade, expand, remodel or renovate Science and Technology Education laboratories in senior high schools, middle and junior high schools". 23 sites were awarded funds.

Staff development workshops were conducted for slightly over 100 middle school Technology Education teachers during the summer of 1993 to acquaint them with state-of-the-art instructional modules and classroom management when implementing the new Technology learning strategies for students. These staff development activities are in support of the recent funding for equipment and facilities for Technology Education program upgrading from Industrial Arts Education to Technology Education.

Because Technology Education is not classified as a vocational job-preparatory program, FETPIP information on student placement and follow-up, Department of Labor specific occupational employment projections have not been available. The following initiatives have been made relating to these activities.

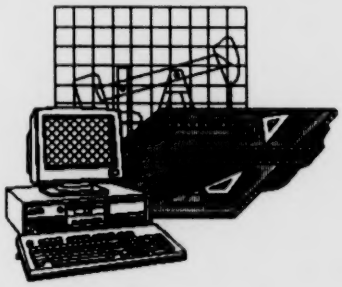
- The Florida Education and Training and Placement Information Activity was requested to follow-up Technology Education students who have completed at least one credit in Technology Education. This review included those students completing in the 91-92 school year: 11,458 seniors were found with 5,911 employed in Florida, 2,550 respondents were employed and continuing education, 1,964 respondents were continuing post-secondary education full time, 14 were employed with the Federal Government and 794 were in the military service.

- A campaign has started to improve Technology Education programs by updating curriculum, staff development, and equipment and laboratories. The purpose of this is to align Technology Education courses with the goals of Tech Prep. Students enrolled in the Technology Education courses that are designed as an articulated technical component part of a Tech Prep type program may be eligible to participate.

- An amendment to section 239.217 Florida Statutes has been proposed to make it possible for students in articulated Technology Education programs to be eligible to participate in the Florida Gold Seal Vocational Endorsement Scholarship programs.

- In response to the constant changes in industry and the corresponding Technology Education curriculum changes, there is a continuing effort to assure that up-to-date equipment is available to provide students with current laboratory experiences.

FACTORS INFLUENCING TECHNOLOGY EDUCATION IN FLORIDA



EVOLUTION AND PARADIGM SHIFT

MANUAL TRAINING	1876
MANUAL ARTS	1890's
INDUSTRIAL ARTS	1904
TECHNOLOGY EDUCATION	1985

CONSTANTS OF HUMAN TECHNOLOGICAL ACTIVITY

- COMMUNICATION
- PRODUCTION
- TRANSPORTATION

EDUCATIONAL NEEDS

- TECHNOLOGICAL LITERACY/READINESS
- GLOBAL AND ECONOMIC COMPETITIVENESS
- INTERDISCIPLINARY INTEGRATION
- APPLIED LEARNING
- PROBLEM SOLVING/CRITICAL THINKING
- COLLABORATIVE TEACHING
- STATE-OF-THE-ART EQUIPMENT/LABORATORIES

EDUCATIONAL REPORTS/INITIATIVES/LEGISLATION/PROJECTS

- CARL PERKINS VOCATIONAL EDUCATION ACT
- SOUTHERN REGIONAL EDUCATION BOARD
- BLUEPRINT FOR CAREER PREPARATION
- NAME CHANGE TO TECHNOLOGY EDUCATION
- TECH PREP
- SECRETARY'S COMMISSION ON ACHIEVING NECESSARY SKILLS
- CONVERSION OF IND. ARTS ED. TO TECHNOLOGY ED. PROJECT, 1990
- BLUEPRINT 2000
- TECHNOLOGY EDUCATION 5 YEAR PLAN, 1993-98
- SPECIFIC APPROPRIATIONS FOR EQUIPMENT/FACILITIES
- FUNDING FOR TEACHER TRAINING/CURRICULUM DEVELOPMENT
- ACADEMIES
- CERTIFICATION
- PROFILE OF TECHNOLOGY EDUCATION COMPETENCIES
- CORE COURSES AND OUTCOMES FOR TECHNOLOGY EDUCATION

STAKEHOLDER/RESEARCH/PROFESSIONAL/CONSENSUS GROUPS

- STATE TECHNICAL COMMITTEE FOR TECHNOLOGY EDUCATION
- FLORIDA TECHNOLOGY EDUCATION ASSOCIATION
- FLORIDA TECHNOLOGY EDUCATION COUNCIL FOR SUPERVISORS
- FLORIDA TECHNOLOGY STUDENT ASSOCIATION
- FLORIDA VOCATIONAL ASSOCIATION
- DISTRICT VOCATIONAL DIRECTORS
- INDUSTRIAL/BUSINESS GROUPS
- FOCUS GROUPS
- INTERDISCIPLINARY GROUPS/COMMITTEES
- INTERNATIONAL TECHNOLOGY EDUCATION ASSOCIATION
- AMERICAN VOCATIONAL ASSOCIATION

TECHNOLOGY EDUCATION - THE NEW BASIC

FLORIDA'S RESPONSE TO THE REALITIES OF A NEW AGE THAT REQUIRES STUDENTS TO BE PREPARED WITH UNIVERSALLY TRANSFERRABLE CAREER SKILLS FOR A GLOBAL MARKET PLACE.

AN ARTICULATED PROGRAM OF TECHNOLOGY EDUCATION (K-12 STUDIES) DESIGNED TO HELP **EVERY** STUDENT BE TECHNOLOGICALLY LITERATE FOR FUTURE WORK AND EDUCATION.

A PROGRAM THAT PROVIDES A BALANCE OF DEPTH AND BREADTH THROUGH HANDS-ON ACADEMIC STUDIES AND THE DEVELOPMENT OF SUCH MENTAL SKILLS AS: CREATIVE THINKING, DECISION MAKING, CRITICAL THINKING, PROBLEM SOLVING, AND FORECASTING.

A PROGRAM THAT STRATEGICALLY TEACHES ESSENTIAL ACADEMIC SKILLS THROUGH INTEGRATED LEARNING EXPERIENCES WITH TECHNOLOGICAL TOOLS, MATERIALS, SYSTEMS AND PROCESSES.

A **LINK** IN THE EDUCATIONAL PROCESS THAT **INTEGRATES** BOTH ACADEMIC AND VOCATIONAL SKILLS THROUGH APPLIED TECHNOLOGY LEARNING ACTIVITIES.

A SERIES OF INTEGRATED LEARNING ACTIVITIES ENABLING STUDENTS TO ENTER A DAZZLING WORLD OF TECHNOLOGICAL ACTIVITY AND CHANGE.

AN IMPORTANT PART OF THE TOTAL SCHOOL CURRICULUM THAT INTEGRATES STUDENTS OF VARIED ABILITIES; DOES NOT SAY TO SOME STUDENTS '*YOU'RE THE WORKERS*', AND TO OTHERS, '*YOU'RE THE THINKERS*'; BUT DEMONSTRATES TO STUDENTS THAT LIFE FOR US ALL IS A BLEND OF BOTH.

TECHNOLOGY EDUCATION OVERALL IS A LIBERATING FORCE WHICH BROADENS ONE'S EDUCATION, WORK PLACE PERSPECTIVE, AND GLOBAL VIEW.

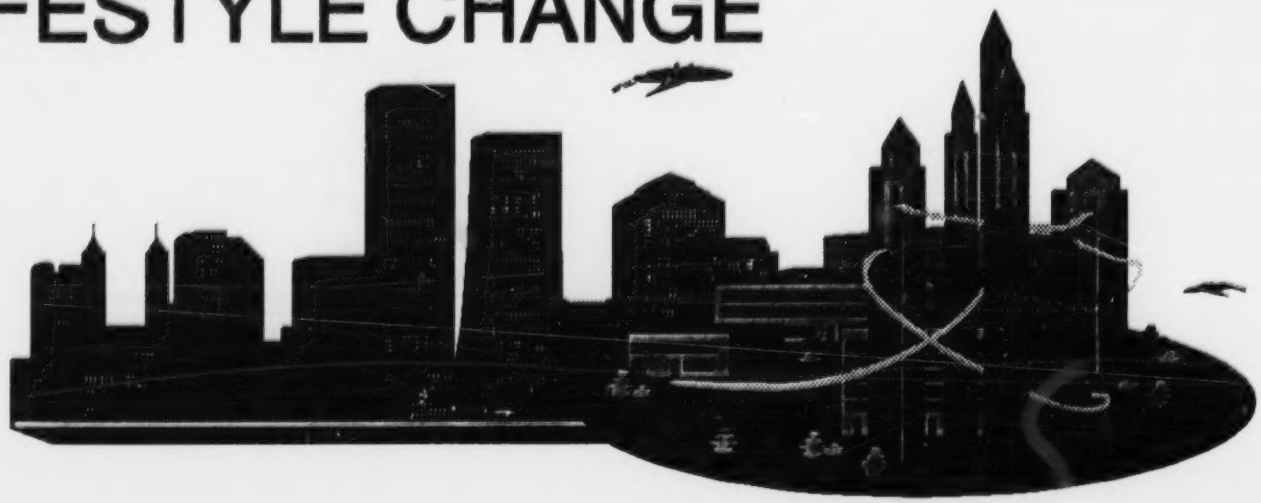
THE END RESULT IS A NEW EDUCATIONAL ESSENTIAL CALLED **"TECHNOLOGICAL LITERACY"**. IT ENABLES OUR YOUTH NOT ONLY TO BE TECHNOLOGICALLY INFORMED BUT TO HAVE TECHNOLOGICAL UNDERSTANDING NECESSARY TO SHAPE TOMORROW'S WORLD.

TECHNOLOGY EDUCATION HISTORY, EVOLUTION, PARADIGM SHIFT

- 1876 - MANUAL TRAINING
- 1890'S - MANUAL ARTS
- 1904 - INDUSTRIAL ARTS
- 1985 - TECHNOLOGY EDUCATION (NATIONAL)
- 1989 - TECHNOLOGY EDUCATION (FLORIDA)

PARADIGM SHIFT

- END OF INDUSTRIAL AGE
- SOCIETAL CHANGE
- LIFESTYLE CHANGE



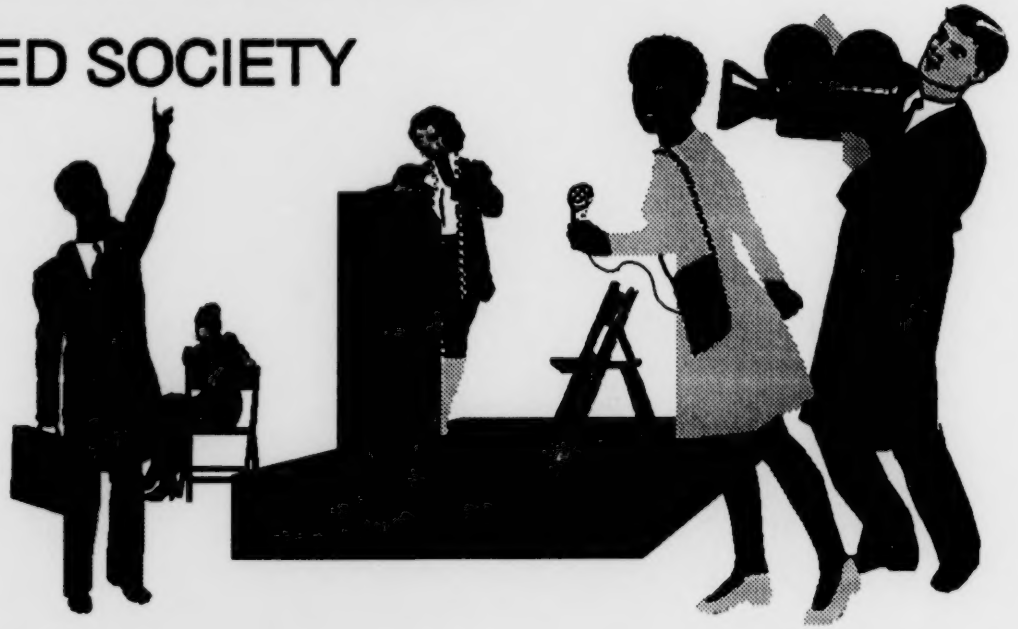
FLORIDA'S HIGH TECHNOLOGY TRIANGLE

FLORIDA'S TECHNOLOGICAL STRENGTHS

- COMPUTER INTEGRATED MANUFACTURING
- SOFTWARE AND COMPUTER SCIENCE
- MEDICAL TECHNOLOGY
- LIGHTWAVE TECHNOLOGY
- MAGNETIC RESEARCH
- MARINE BIOTECHNOLOGY
- SIMULATION AND TRAINING
- MICROELECTRONICS
- AEROSPACE
- ENTERTAINMENT

MAJOR CHARACTERISTICS OF AMERICAN SOCIETY

- DEMOCRATIC BY CHOICE AND PERSUASION
- TECHNOLOGICAL IN NATURE
- AN EDUCATED SOCIETY



STAKEHOLDER/RESEARCH/PROFESSIONAL/ CONSENSUS GROUPS IN TECHNOLOGY EDUCATION

STATE TECHNICAL COMMITTEE FOR TECHNOLOGY EDUCATION

FLORIDA TECHNOLOGY EDUCATION ASSOCIATION

FLORIDA TECHNOLOGY EDUCATION COUNCIL FOR SUPERVISORS

FLORIDA TECHNOLOGY STUDENT ASSOCIATION

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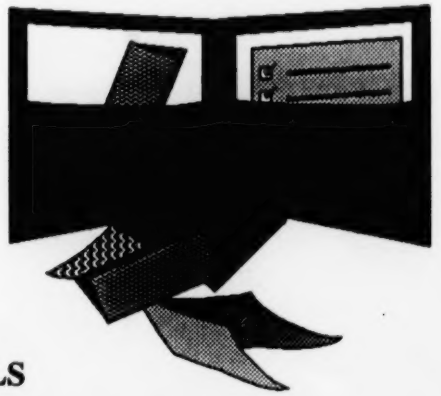
AMERICAN VOCATIONAL ASSOCIATION

EDUCATIONAL REPORTS/INITIATIVES/LEGISLATION/PROJECTS INFLUENCING TECHNOLOGY EDUCATION



CARL PERKINS VOCATIONAL EDUCATION ACT

SOUTHERN REGIONAL EDUCATION BOARD

BLUEPRINT FOR CAREER PREPARATION

NAME CHANGE TO TECHNOLOGY EDUCATION

TECH PREP

SECRETARY'S COMMISSION ON ACHIEVING NECESSARY SKILLS

CONVERSION OF INDUSTRIAL ARTS EDUCATION TO TECHNOLOGY EDUCATION PROJECT, 1990

BLUEPRINT 2000

TECHNOLOGY EDUCATION 5 YEAR PLAN, 1993-98

SPECIFIC APPROPRIATIONS FOR EQUIPMENT/FACILITIES

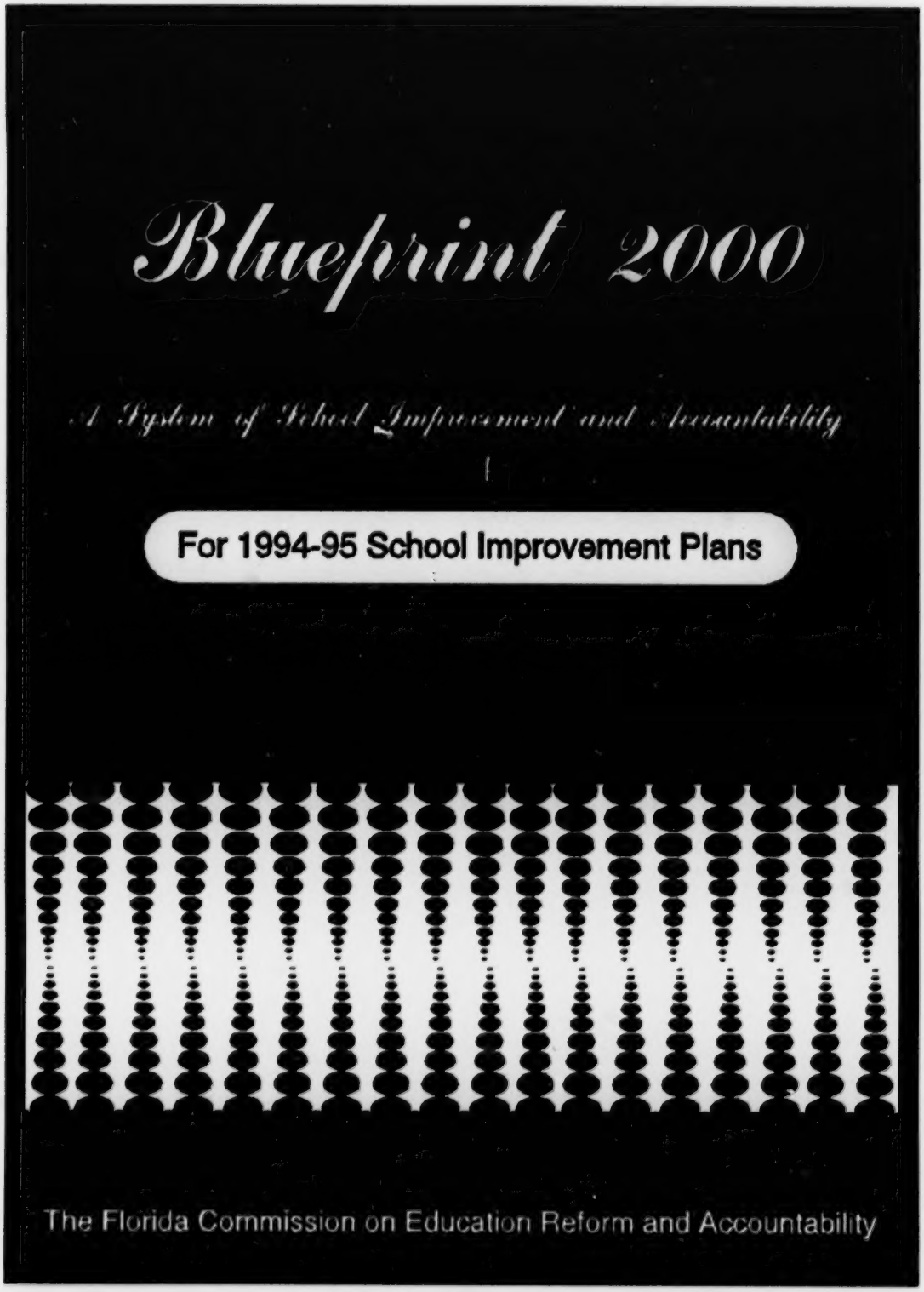
FUNDING FOR TEACHER TRAINING/CURRICULUM DEVELOPMENT

ACADEMIES

CERTIFICATION

PROFILE OF TECHNOLOGY EDUCATION COMPETENCIES

CORE COURSES AND OUTCOMES FOR TECHNOLOGY EDUCATION


Blueprint 2000
A System of School Improvement and Accountability
For 1994-95 School Improvement Plans
The Florida Commission on Education Reform and Accountability

A SCANS/TECHNOLOGY EDUCATION SIDE BY SIDE COMPARISON

SCANS COMPETENCIES	TECHNOLOGY EDUCATION COMPETENCIES
RESOURCES ♦ Select goal-relevant activities, rank them, allocate time, and prepare and follow schedules. ♦ Use or prepare budget, make forecast, keep records, and make adjustments to meet objectives. ♦ Acquire, store, allocate, and use materials or space efficiently. ♦ Assess skills and distribute work accordingly, evaluate performance and provide feedback.	**RESOURCES** ♦ Demonstrate an understanding that technology is the application of knowledge to solve problems and extend human capabilities. ♦ Identify resources of technology. ♦ Select appropriate resources for technological decision-making. ♦ Express a knowledge of the essential elements and organization of the free enterprise system. ♦ Demonstrate an understanding of entrepreneurship. ♦ Describe the legal, ethical, social and economic factors, that influence technology.
INTERPERSONAL ♦ Contribute to group effort. ♦ Work to satisfy customers' expectations. ♦ Communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies. ♦ Work toward agreements involving exchange of resources, resolve divergent interests. ♦ Work well with men and women from diverse backgrounds.	**INTERPERSONAL** ♦ Adjust to a changing technological environment. ♦ Exhibit positive human relations and leadership skills. ♦ Display an understanding and appreciation for the dignity and worth of honest labor. ♦ Participate as an active member of a technology based student organization. ♦ Demonstrate positive employability skills.

SCANS COMPETENCIES	TECHNOLOGY EDUCATION COMPETENCIES
INFORMATION ♦ Acquire and evaluate information. ♦ Organize and maintain information. ♦ Interpret and communicate information. ♦ Use computers to process information.	**INFORMATION** ♦ Demonstrate the use of technological systems in processing information. ♦ Demonstrate an understanding of technology as a base for career opportunities. ♦ Research consumer information. ♦ Discuss the outputs of technology on society and the environment. ♦ Identify kinds and levels of work common to technology. ♦ List requisites and employment opportunities for employment in today's and our future technological world. ♦ Demonstrate a knowledge of the history and development of technology. ♦ Identify evolving technologies in our technological world.
SYSTEMS ♦ State how social, organizational, and technological systems work and operate effectively work with them. ♦ Distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions. ♦ Suggest modifications to existing systems and develop new or alternative systems to improve performance.	**SYSTEMS** ♦ Apply technological tools, machines, instruments, systems, materials, and processes. ♦ Demonstrate computer application and literacy. ♦ Utilize the systems approach in technology. ♦ Demonstrate the use of a computer to integrate and control mechanical, fluid, thermal, and electrical systems. ♦ Utilize various controls for technological systems. ♦ Demonstrate knowledge of the basic principles of technology, the basic elements of systems, and the components of each basic element.

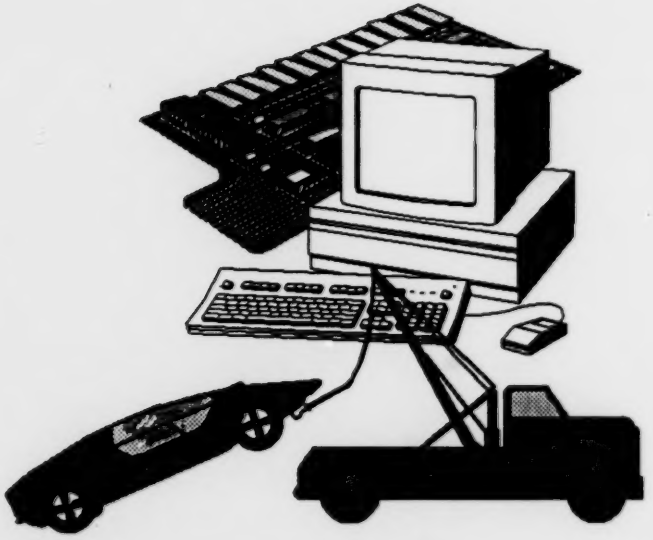
SCANS COMPETENCIES	TECHNOLOGY EDUCATION COMPETENCIES
TECHNOLOGY ♦ Choose procedures, tools or equipment including computers and related technologies. ♦ Understand overall intent and proper procedures for setup and operation of equipment. ♦ Prevent, identify, or solve problems with equipment, including computers and other technologies.	**TECHNOLOGY** ♦ Demonstrate technological literacy. ♦ Demonstrate a knowledge and appreciation for the importance of technology. ♦ Deal with technological forces that influence the future. ♦ Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, processes, systems, and materials. ♦ Utilize tools, machines, and equipment in the technology laboratory. ♦ Perform special technological skills unique to design, electronics, engineering, computers, communications, manufacturing, construction, energy, power, transportation, biotechnology, and human services.
BASIC SKILLS ♦ Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules. ♦ Communicate thoughts, ideas, information, and messages in writing; and create documents such as letters, directions, manuals, reports, graphs, and flow charts. ♦ Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques. ♦ Receive, attend to, interpret, and respond to verbal messages and other cues. ♦ Organize ideas and communicate orally.	**BASIC SKILLS** ♦ Apply other school subjects appropriate to technology content, instruction, and laboratory activities. ♦ Apply basic skills in communications, mathematics, and science related to technological content and learning activities.

SCANS COMPETENCIES	TECHNOLOGY EDUCATION COMPETENCIES
THINKING SKILLS ♦ Generate new ideas. ♦ Specify goals and constraints, generate alternatives, consider risks, evaluate and choose best alternative. ♦ Recognize a problem and devise and implement a plan of action. ♦ Organize and process symbols, pictures, graphs, objects, and other information. ♦ Use efficient learning techniques to acquire and apply new knowledge and skills. ♦ Discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.	**THINKING SKILLS** ♦ Describe positive and negative impacts of technology. ♦ Demonstrate problem-solving and decision-making abilities using technological means. ♦ Demonstrate and apply design/problem-solving processes. ♦ Conduct a technological research and experimentation project. ♦ Forecast a technological event.
PERSONAL QUALITIES ♦ Exert a high level of effort and persevere towards goal attainment. ♦ Believe in own self-worth and maintain a positive view of self. ♦ Demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings. ♦ Assess self accurately, set personal goals, monitor progress, and exhibit self control. ♦ Choose ethical courses of action.	**PERSONAL QUALITIES** ♦ Demonstrate the skills, creative abilities, positive self-concepts, and individual capabilities to use a variety of technologies. ♦ Discuss individual interests and aptitudes as they relate to a career. ♦ Make an informed and meaningful career choice. ♦ Demonstrate a positive attitude toward lifelong learning.

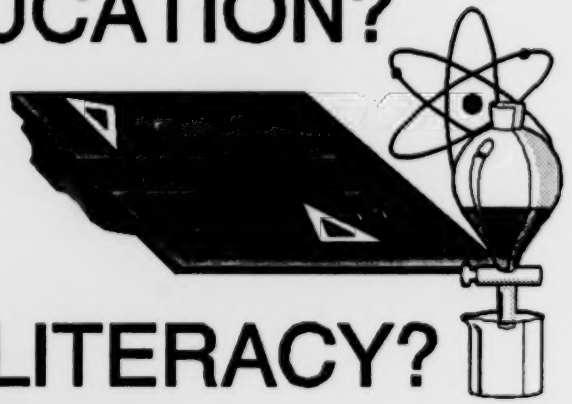
NEEDS ASSESSMENT FINDINGS

- TECHNOLOGY IS ONE OF THE SINGLE GREATEST FORCES IN OUR LIVES AND WE MUST STUDY IT AS SUCH.
- WORKING AND THINKING CANNOT BE SEPARATED. LIFE IS A BLEND OF BOTH.
- THE ECONOMY NEEDS, USES, AND REWARDS AN ARRAY OF HUMAN TALENTS MUCH WIDER THAN NARROW ACADEMIC AND OCCUPATIONAL SKILLS.
- ROUTINE, STATIC, CRAFT SKILLS ARE GIVING WAY TO UNDERSTANDING SYSTEMS.
- SKILLS WILL NEED TO BE TRANSFERABLE SO THEY CAN BE APPLIED IN A VARIETY OF WAYS.
- WITHIN THE 4 WALLS OF A SCHOOL WE CANNOT PREPARE EVERY STUDENT FOR A SPECIALIZED OCCUPATION. WE CAN AND MUST HELP EVERY STUDENT LEARN ABOUT THE TECHNOLOGY REVOLUTION THAT WILL DRAMATICALLY SHAPE THEIR LIVES.
- LEARNING HOW TO LEARN IS A MAJOR NEED.
- LEARNING IS SUPPLANTING WORK AS THE CENTRAL ETHIC.
- STUDENTS NEED TO UNDERSTAND THAT THEY MAY FIND IT NECESSARY TO PREPARE ANEW FROM 3-6 TIMES OVER THEIR POTENTIAL 100 YEAR LIFESPAN.
- GRADUATING STUDENTS NEED TO BE ADJUSTABLE, ADAPTABLE, AND CHANGE-ORIENTED.
- TECHNOLOGY EDUCATION IS A BASIC AND FUNDAMENTAL STUDY FOR ALL PERSONS, REGARDLESS OF EDUCATIONAL OR CAREER GOAL.

WHAT IS:

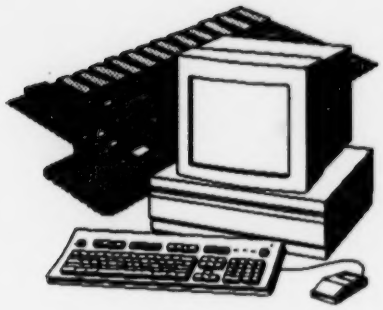


- TECHNOLOGY?
- TECHNOLOGY EDUCATION?



- TECHNOLOGICAL LITERACY?

TECHNOLOGY



- OUR ABILITY TO DO THINGS
- MAN'S HANDIWORK
- THE WAY THINGS WORK
- APPLICATION OF KNOWLEDGE, TOOLS, AND SKILLS TO SOLVE PRACTICAL PROBLEMS
- EXTENDS HUMAN CAPABILITIES
- CONCEIVED BY INVENTORS AND PLANNERS
- ENHANCED BY DISCOVERIES OF SCIENCE
- SHAPED BY DESIGNS OF ENGINEERING
- RAISED TO FRUITION BY THE WORK OF ENTRENPRENEURS AND CRAFTSMEN
- USED BY SOCIETY

TECHNOLOGY EDUCATION

- **RESPONDING TO THE REALITIES OF A NEW AGE**
- **COMPREHENSIVE/HOLISTIC**
- **CONCERNED WITH TECHNOLOGICAL:**

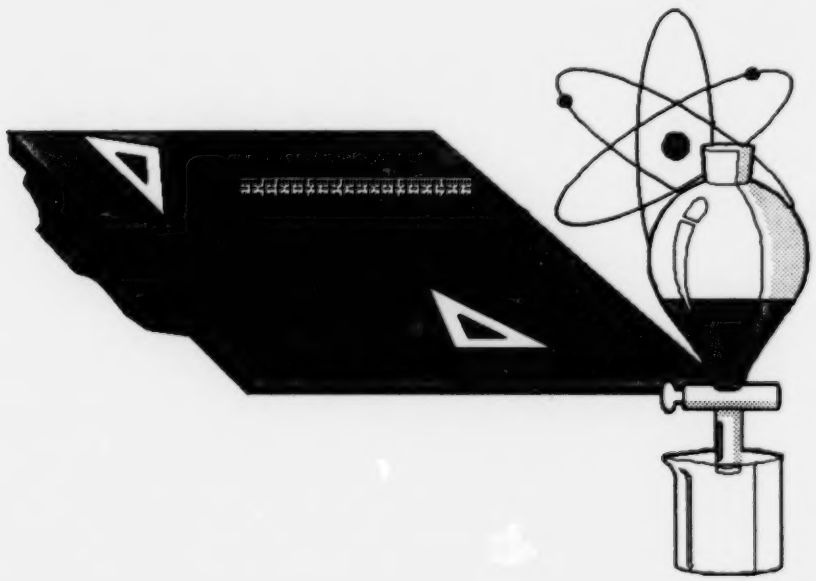
TOOLS	**SYSTEMS**
RESOURCES	**ORGANIZATION**
MATERIALS	**UTILIZATION**
PROCESSES	**CULTURAL IMPACT**

- **ACTION-BASED**
- **HANDS-ON/MINDS-ON**
- **INTEGRATED LEARNING**
- **THE NEW BASIC**
- **A K - 12 PROGRAM**
- **A SOUND AND ACHIEVABLE CONCEPT**
- **A LIBERATING FORCE THAT DOES NOT NARROW ONE'S EDUCATION OR ONE'S VIEW OF THE WORLD**

TECHNOLOGICAL LITERACY

MEANS THAT A PERSON MUST:

- **UNDERSTAND BASIC TECHNOLOGICAL CONCEPTS**
- **KNOW SOCIETAL NEEDS AND MORAL CONSTRAINTS**
- **BE COGNIZANT OF SCIENTIFIC AND MATHEMATICAL APPLICATIONS TO TECHNOLOGICAL TOOLS AND MATERIALS**
- **BE ABLE TO UTILIZE TECHNOLOGICAL TOOLS AND MATERIALS**

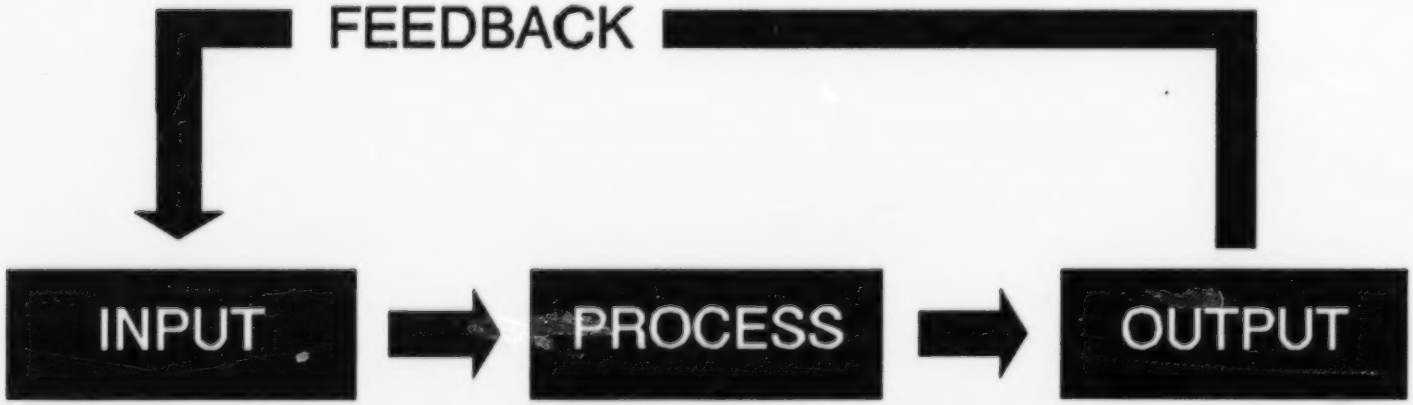


MAJOR DIFFERENCES: INDUSTRIAL ARTS AND TECHNOLOGY EDUCATION

	Industrial Arts	Technology Education
Mission	Teach about tools, materials, industrial processes	A holistic study of technology
Conceptual Base	Undefined; teacher choice	Defined; major concepts and behaviors are identified in curriculum frameworks
Content Organizers	Discrete materials, or processes	System elements; inputs, resources, processes, outputs, feedback/control, constants of human technological activity
Use of Project	Often used as an end in itself	Means to an end
Mental Process Skills (Problem Solving; Decision Making, Creative Thinking)	An informal program element;occasionally overlooked	Planned as a formal element of program; central to activity
Activity Base	75% Hands-on; Unit shops	75% Hands-on; technology systems laboratories
Relationships to Other Disciplines	Philosophically yes; in practice, rare. Little formal attempt to match interdisciplinary concepts to Industrial Arts activity	Interdisciplinary relationships addressed in each activity; Technology Education is conceived as an integrating discipline

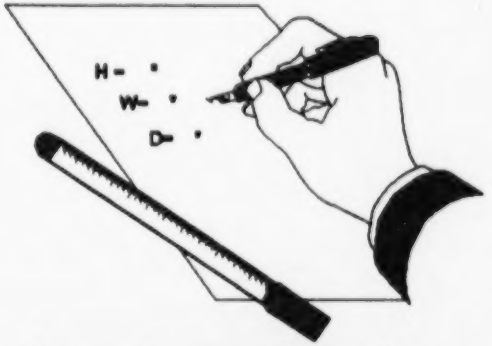
TECHNOLOGY		SCIENCE
Tools, machines, power, instrumentation, processes, techniques, systems, materials, organizations, etc.		Stars, planets, galaxies, cells, atoms, particles, etc.
Designing, doing, making, implementing, applying, etc.		Investigation, discovery, formulation of theories, etc.
Often precedes or spawns new scientific discoveries		Often precedes or spawns new technological applications
Dependent on science		Dependent on technology
Action oriented and requires intervention		Remains separate from what is being investigated.
Involved constantly in studying means/ends relationships		Research/theory oriented
Systems oriented.		Laws/principles oriented

UNIVERSAL SYSTEMS MODEL

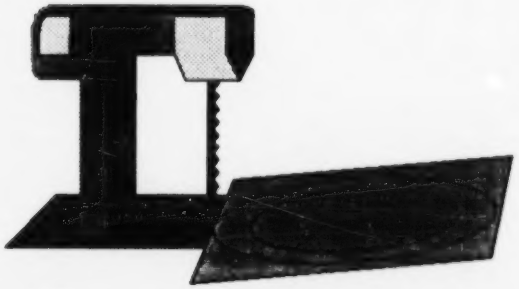


PROBLEM SOLVING

Understand the problem



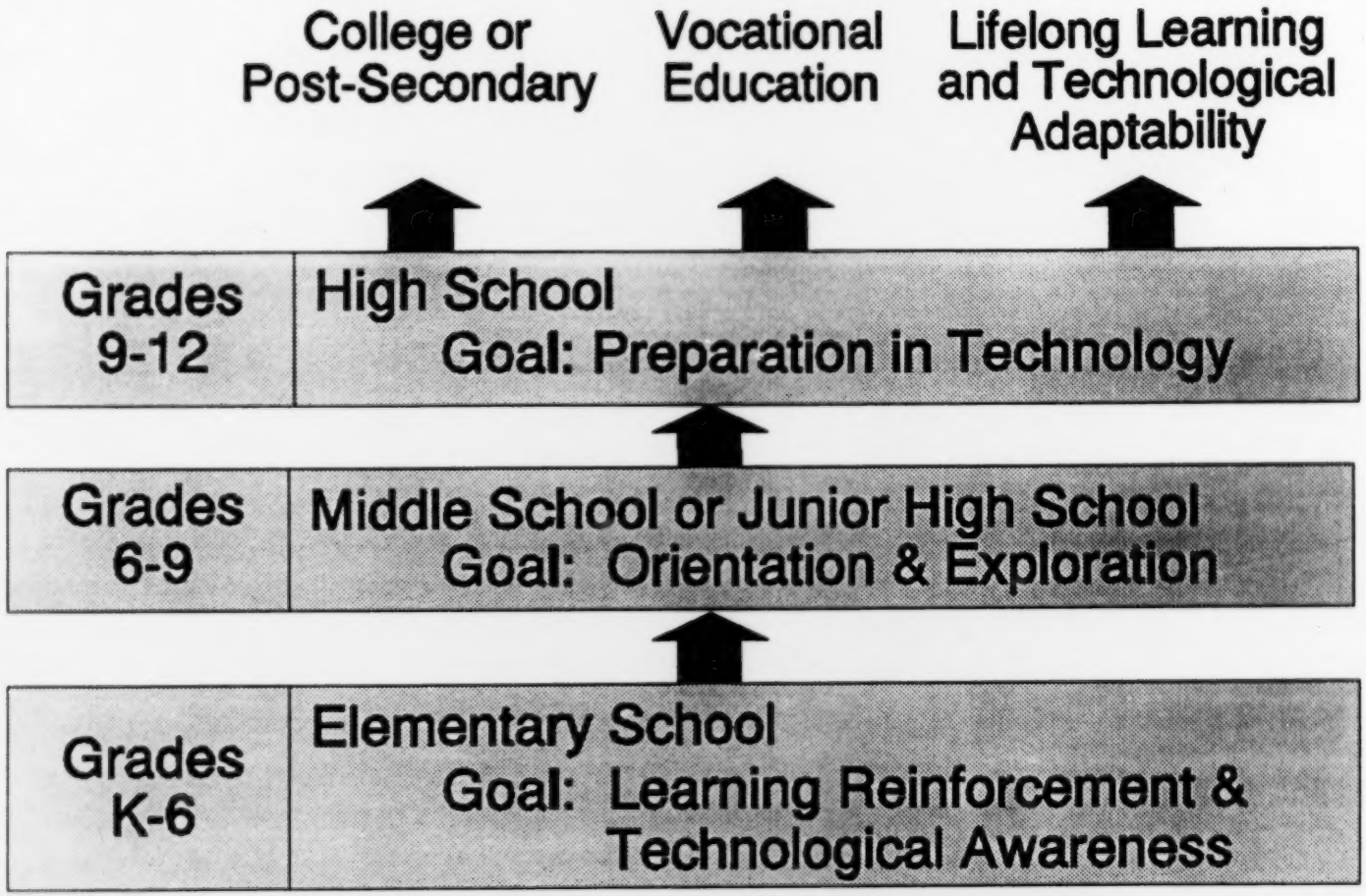
Make a plan to solve it



Carry out the plan

Evaluate the solution

From Florida Technology in Education Quarterly, Vol. 6, No. 3, Spring 1994



GOALS & CAREER PATHS FOR TECHNOLOGY EDUCATION STUDENTS

DEFINITION OF TECHNOLOGY EDUCATION

Technology education is a comprehensive, action-based K-12 discipline designed to incorporate information technologies, physical technologies, and biotechnologies in promoting the integration of academic and career skills with an emphasis on problem solving and decision making that is essential in developing the human potential needed to compete in a technological society.

MISSION

TO PREPARE EVERY STUDENT TO ENCOUNTER TECHNOLOGY ON AN EVER CHANGING BASIS THROUGHOUT THEIR LIVES, TO KNOW WHAT IT MEANS AND HOW IT CAN BE RATIONALLY AND ETHICALLY APPLIED.

TECHNOLOGY EDUCATION GOALS

The student will evaluate the impact of technology on product and process, markets, organization structures, and people.

The student will adapt to a competitive and changing technological world.

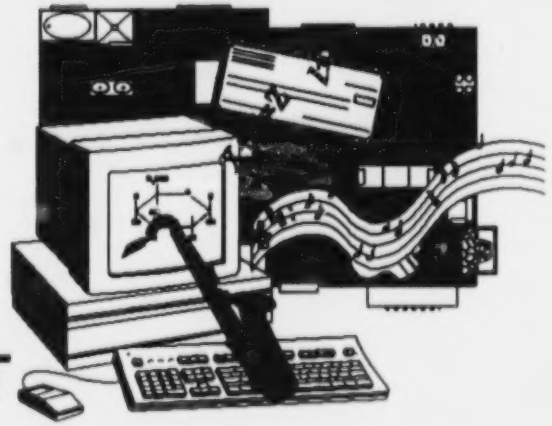
The student will analyze and adapt to a wide variety of technology-related careers.

The student will apply tools, materials, processess, and technological concepts safely and efficiently.

The student will apply critical thinking in all areas of learning to solve technological problems.

The student will use particular talent related to technology for innovative and creative thinking.

TECHNOLOGY EDUCATION GOALS FOR THE ELEMENTARY LEVEL



- LEARNING ENRICHMENT
- PERSONAL DEVELOPMENT
- TECHNOLOGICAL AWARENESS
- TECHNOLOGICAL INFLUENCES ON SOCIETY

TECHNOLOGY EDUCATION GOALS FOR THE MIDDLE SCHOOL LEVEL

- EXPLORATORY EXPERIENCES
- INFORMED & MEANINGFUL CHOICES (EDUCATIONAL & OCCUPATIONAL)
- DEVELOP INNATE TALENTS, ATTITUDES AND SKILLS
- DEVELOP ADAPTIVE SKILLS FOR THE FUTURE

TECHNOLOGY EDUCATION GOALS FOR THE HIGH SCHOOL LEVEL

- PREPARATION FOR ADVANCED VOCATIONAL/TECHNICAL AND COLLEGIATE PROGRAMS

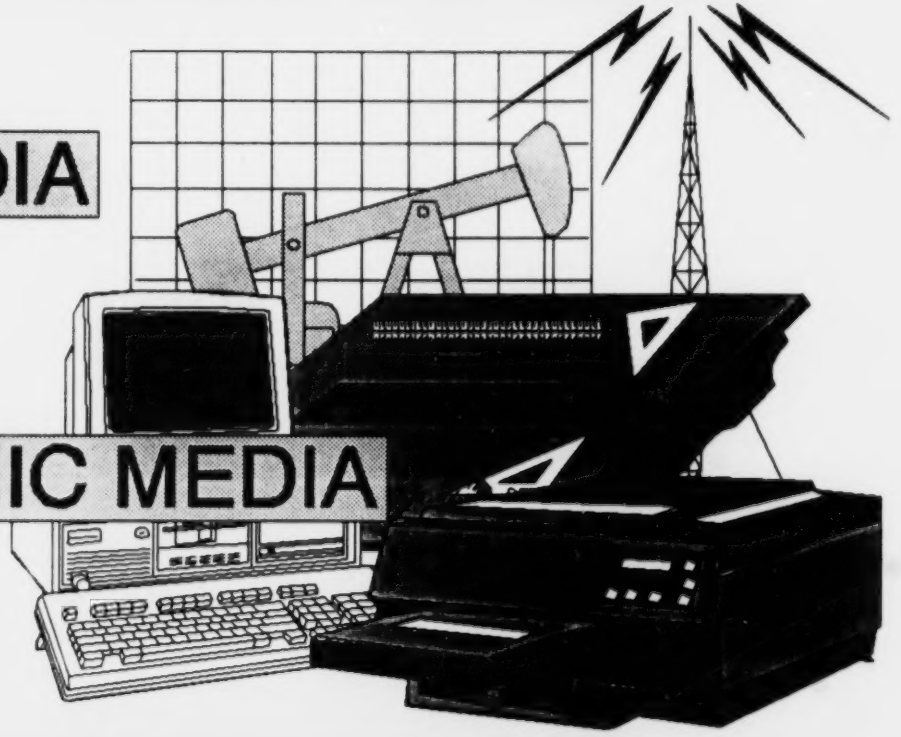
- EQUIPPED WITH UNIVERSALLY TRANSFERABLE TECHNOLOGICAL SKILLS

CONSTANTS OF HUMAN TECHNOLOGICAL ACTIVITY

- COMMUNICATION
- PRODUCTION
- TRANSPORTATION

COMMUNICATIONS

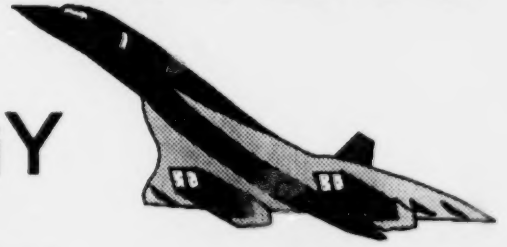
- PRINT MEDIA
- ELECTRONIC MEDIA
- ENGINEERING AND DESIGN



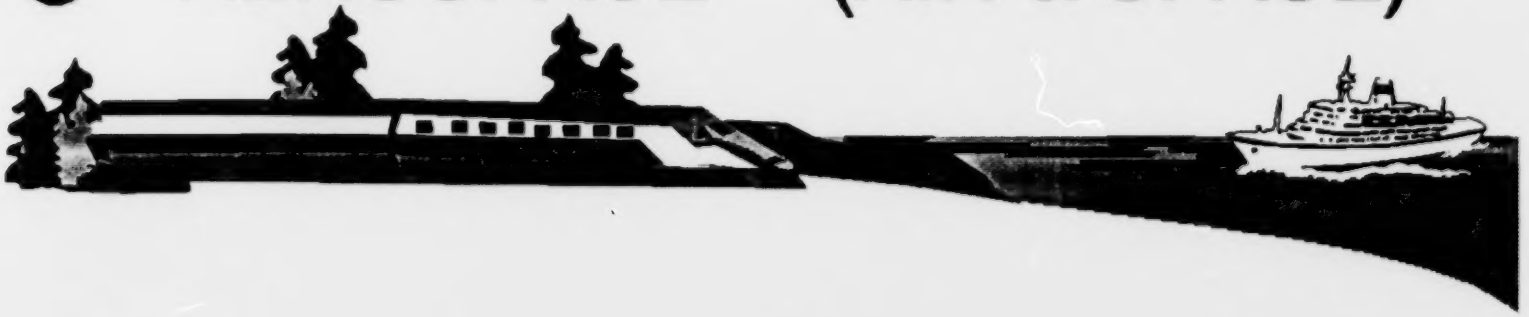
PRODUCTION

- FABRICATION
- MATERIALS
- BIOTECHNOLOGY

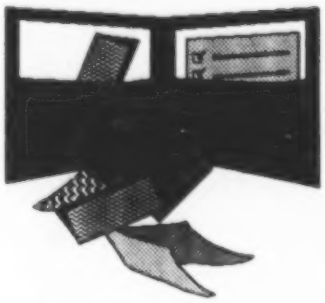
TRANSPORTATION



- POWER AND ENERGY
- TERRESTRIAL (LAND)
- MARINE (SEA)
- AEROSPACE (AIR & SPACE)



1993-94 Technology Education Programs

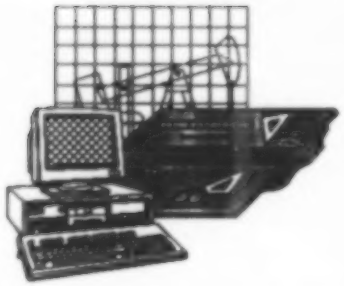


Introduction to Technology
Orientation to Technology
Exploring Technology
Exploration of Aerospace Technology
Exploration of Construction Technology
Exploration of Graphic Communications Technology
Exploration of Manufacturing Technology
Exploration of Power and Transportation Technology
Exploration of Electricity/Electronics Technology
Practical Visual Communications
Practical Home Maintenance
Practical Power Mechanics and Energy
Practical Industrial Skills
Practical Applied Technology
Practical Applied Electronics
Practical Digital Electronics
Principles of Aerospace Technology
Principles of Construction Technology
Principles of Drafting Technology
Principles of Electronics Technology
Principles of Energy and Power Technology Systems
Principles of Graphic Communications Technology Systems
Principles of Materials and Processes Technology
Principles of Engineering Technology
Principles of Production Technology
General Studies in Technology

TECHNOLOGY EDUCATION PROGRAMS
1994-95

COURSE NUMBERS	TITLE
8600110	ORIENTATION TO TECHNOLOGY
8600280	EXPLORATION OF AEROSPACE TECHNOLOGY
8600220	EXPLORATION OF GRAPHIC COMMUNICATIONS TECHNOLOGY
8600230	EXPLORATION OF MANUFACTURING TECHNOLOGY
8600240	EXPLORATION OF POWER AND TRANPORTATION TECHNOLOGY
8601000	COMMUNICATIONS TECHNOLOGY
8600800	DRAFTING AND DESIGN TECHNOLOGY
8600900	ELECTRONICS TECHNOLOGY
8601300	ENGINEERING TECHNOLOGY
8600000	INTEGRATED TECHNOLOGY STUDIES
8601200	POWER AND TRANSPORTATION TECHNOLOGY
8601600	PRINCIPLES OF AEROSPACE TECHNOLOGY
8600700	PRINCIPLES OF CONSTRUCTION TECHNOLOGY
8601100	PRINCIPLES OF MATERIALS AND PROCESSES TECHNOLOGY
8601400	PRODUCTION TECHNOLOGY
8600500	TECHNOLOGY APPLICATIONS I
8600600	TECHNOLOGY APPLICATIONS II
8601700	TECHNOLOGY APPLICATIONS III
8601500	TECHNOLOGY STUDIES
8600400	TECHNOLOGY SYSTEMS

PROGRAM AND COURSE ALIGNMENT
1994-1995



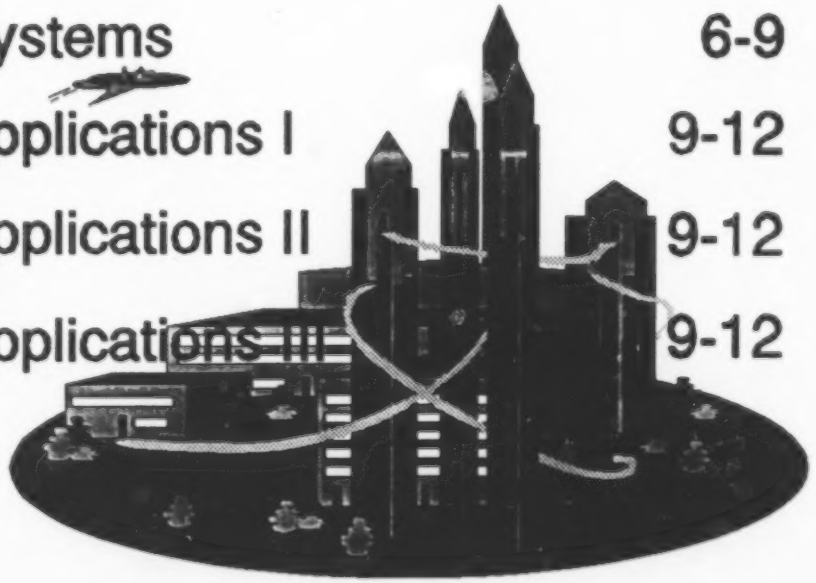
PROGRAM/COURSE NUMBER	TITLE	GRADE
8600110	Orientation to Technology	6-9
8600220	Exploration of Graphic Communications Technology	6-9
8600230	Exploration of Manufacturing Technology	6-9
8600240	Exploration of Power and Transportation Technology	6-9
8600270	World of Technology (under development)	6
8600000	Integrated Technology Studies - Introduction to Technology - Exploring Technology - Exploring Communications Technology - Exploring Production Technology	6-9
8600400	Technology Systems - Communications - Aerospace - Power & Transportation - Production - Drafting & Design - Electronics - Engineering - Applied Technology - Home Technology	9-12
8600500	Technology Applications I - Technology Studies I - Production Technology I - Engineering Technology I	9-12
8600600	Technology Applications II - Technology Studies II - Production Technology II - Engineering Technology II	9-12
8601700	Technology Applications III - Technology Studies III - Production Technology III - Engineering Technology III	9-12
8600700	Construction Technology - I-II-III	9-12
8600800	Drafting and Design Technology - I-II-III	9-12
8600900	Electronics Technology - I-II-III	9-12
8601000	Communications Technology - I-II-III	9-12
8601100	Materials and Processes Technology - I-II-III	9-12
8601200	Power and Transportation Technology - I-II-III	9-12
8601300	Engineering Technology - I-II-III	9-12
8601400	Production Technology - I-II-III	9-12
8601500	Technology Studies - I-II-III	9-12
8601600	Aerospace Technology - I-II-III	9-12

TECHNOLOGY EDUCATION PROPOSED PROGRAM CHANGES FOR 1995-98

Program/Course Number	Program/Course Title	Grade Levels	Graduation Requirements	Credit	Certification
8600000	Integrated Technology Studies	6-9			I ART-TEC 1 2
8600010	Introduction to Technology		VO	0.5	INDUS ARTS ~~04~~ ~~06~~
8600020	Exploring Technology		VO	0.5	
8600030	Exploration of Communications Technology		VO	0.5	
8600040	Exploration of Production Technology		VO	0.5	
8600050	Exploration of Aerospace Technology		VO	0.5	
8600400	Technology Systems	9-12,30,31			I ART-TEC 1 2
8600410	Communications Systems		VO	0.5	INDUS ARTS ~~04~~ ~~06~~
8600420	Power and Transportation Systems		VO	0.5	
8600430	Production Systems		VO	0.5	
8600440	Illustrative Design Systems		VO	0.5	
8600450	Electronics Systems		VO	0.5	
8600460	Engineering Systems		VO	0.5	
8600470	Applied Technology Systems		VO	0.5	
8600480	Home Technology systems		VO	0.5	
8600500	Technology Applications I	9-12,30,31			I ART-TEC 1 2
8600510	Technology Studies I		VO	1.0	INDUS ARTS ~~04~~ ~~06~~
8600520	Communications technology I		VO	1.0	
8600530	Power and Transportation Technology I		VO	1.0	
8600540	Production Technology I		VO	1.0	
8600550	Illustrative Design Technology I		VO	1.0	
8600560	Electronics Technology I		VO	1.0	
8600570	Engineering Technology I		VO	1.0	
8600580	Aerospace Technology I		VO	1.0	
8600600	Technology Applications II	9-12,30,31			I ART-TEC 1 2
8600610	Technology Studies II		VO	1.0	INDUS ARTS ~~04~~ ~~06~~
8600620	Communications Technology II		VO	1.0	
8600630	Power and Transportation Technology II		VO	1.0	
8600640	Production Technology II		VO	1.0	
8600650	Illustrative Design Technology II		VO	1.0	
8600660	Electronics Technology II		VO	1.0	
8600670	Engineering Technology II		VO	1.0	
8600680	Aerospace Technology II		VO	1.0	
8601700	Technology Applications III	9-12,30,31			I ART-TEC 1 2
8601710	Technology Studies III		VO	1.0	INDUS ARTS ~~04~~ ~~06~~
8601720	Communications Technology III		VO	1.0	
8601730	Power and Transportation Technology III		VO	1.0	
8601740	Production Technology III		VO	1.0	
8601750	Illustrative Design Technology III		VO	1.0	
8601760	Electronics Technology III		VO	1.0	
8601770	Engineering Technology III		VO	1.0	
8601780	Aerospace Technology IIII		VO	1.0	

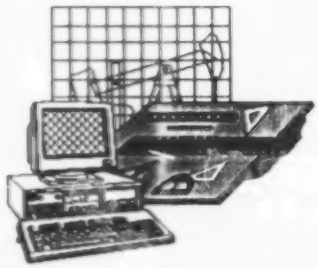
TECHNOLOGY EDUCATION
PROPOSED COURSE CODE DIRECTORY CHANGES
1995-98

8600270	World of Technology	6
8600000	Integrated Technology Studies	6-9
8600400	Technology Systems	6-9
8600500	Technology Applications I	9-12
8600600	Technology Applications II	9-12
8601700	Technology Applications III	9-12



CORE OUTCOMES

- Demonstrate the ability to work safely with a variety of technologies.
- Demonstrate interpersonal skills as they relate to the workplace.
- Identify and apply methods of information acquisition and utilization.
- Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
- Demonstrate and apply design/problem-solving processes.
- Express an understanding of technological systems and their complex interrelationships.
- Demonstrate the ability to properly identify, organize, plan, and allocate resources.
- Discuss individual interests and aptitudes as they relate to a career.
- Demonstrate employability skills.
- Demonstrate an understanding of entrepreneurship.
- Make an informed and meaningful career choice.



04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

COMMUNICATIONS

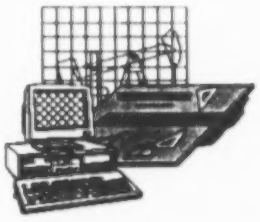
04.01	Identify and explain the main and subordinate ideas in a written work.
04.02	Distinguish different purposes and methods of writing, identify a writer's point of view and interpret a writer's meaning.
04.03	Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04	Distinguish fact from opinion.
04.05	Read critically by asking pertinent questions, by recognizing assumptions and implications and by evaluating ideas.
04.06	Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07	Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08	Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09	Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10	Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11	Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12	Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13	Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

MATHEMATICS

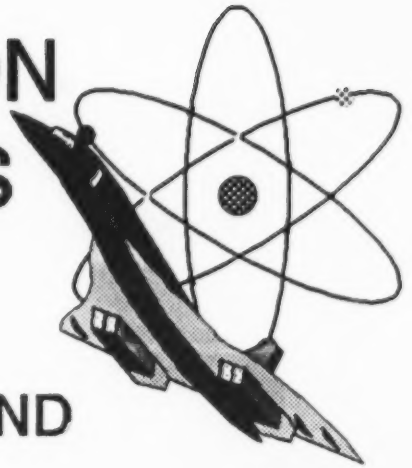
04.14	Use the mathematics of: -integers, fractions, and decimals; -ratios, proportions, and percentages; -roots and powers; -algebra;
04.15	-geometry.
04.16	Make estimates and approximations, and judge the reasonableness of a result.
04.17	Use elementary concepts of probability and statistics.
	Draw, read, and analyze graphs, charts, and tables.

SCIENCE

04.18	Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19	Organize and communicate the results obtained by observation and
04.20	experimentation.
04.21	Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure). Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).



TECHNOLOGY EDUCATION ISSUES AND CONCERNS



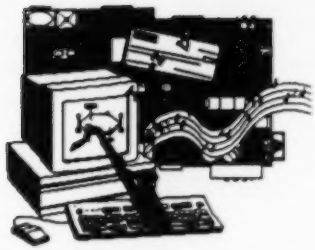
- CONTENT AND METHODOLOGY
- TEACHER TRAINING/SUPPLY/DEMAND
- CERTIFICATION
- LABORATORY PLANNING AND FUNDING
- STATE-OF-THE-ART EQUIPMENT
- INTERDISCIPLINARY INTEGRATION/ COLLABORATION
- STAKE HOLDER CONSENSUS
- GOLD SEAL ELIGIBILITY

TECHNOLOGY EDUCATION PLANS

- FIVE YEAR PLAN, 1993-98
- CURRICULUM RESTRUCTURING
- PROGRAM DEVELOPMENT & FUNDING
- TEACHER RECRUITMENT & TRAINING
- CERTIFICATION REVISIONS
- PROGRAM GUIDE DEVELOPMENT
- EVALUATION AND CONSENSUS
- LONG RANGE PLANNING BEYOND 1998

DRAFT SAMPLE

Profile of Generic Technology Competencies for Technology Education Instruction Related to Goals 2, 3, & 6 in Blueprint 2000



Discipline/Standard Generic	A	B	
Standard #1 Florida students locate, comprehend, interpret, evaluate, maintain, and apply information, concepts, and ideas found in literature, the arts, symbols, recordings, video and other graphic displays, and computer files, in order to perform tasks and/or for enjoyment.	Use a computer to process information. List ways in which computer are used in technology. Demonstrate the application of a computer.	Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography. Read and follow complex written directions.	Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
Standard #2 Florida students communicate in English and other languages using information, concepts, prose, symbols, reports, audio and video recordings, speeches, graphic displays, and computer-based programs.	Use a computer to process information. Define terms related to computer parts and usage. Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level. Write Standard English sentences with correct: sentence structure; verb forms;punctuation, capitalization, possessives, plural forms, and other matters of mechanics; word choice and spelling.	Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities. Identify and explain the main and subordinate ideas in a written work. Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.	Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary. Distinguish fact from opinion. Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

CURRICULUM FRAMEWORK
FLORIDA DEPARTMENT OF EDUCATION

PROGRAM AREA: Technology Education
EFFECTIVE DATE: July, 1994

PROGRAM TITLE: Technology Applications II

CODE NUMBER: Secondary 8600600 Postsecondary _____

Florida CIP 0821.011200

SECONDARY
SCHOOL CREDITS 3 COLLEGE CREDITS _____

POSTSECONDARY ADULT
VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____7-9 X 9-12 ____Postsecondary Adult Vocational

_____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT:The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Laboratory experiences revolve around the physical technologies of construction, energy and power, manufacturing, material processing and transportation; information/communication technologies of information processing, graphic communication and electronic communications; and biotechnologies in agriculture, health care and medicine.

The content includes intermediate studies in areas of technology which include Communications, Power and Transportation, Production, Drafting and Design, Electronics, and Engineering.

Listed below are the level II courses in the Technology Applications I thru III sequence offered at secondary schools followed by the laboratory design codes appropriate for the courses.

8600610	Technology Studies II	(243)
8600640	Production Technology II	(243)
8600670	Engineering Technology II	(243)

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

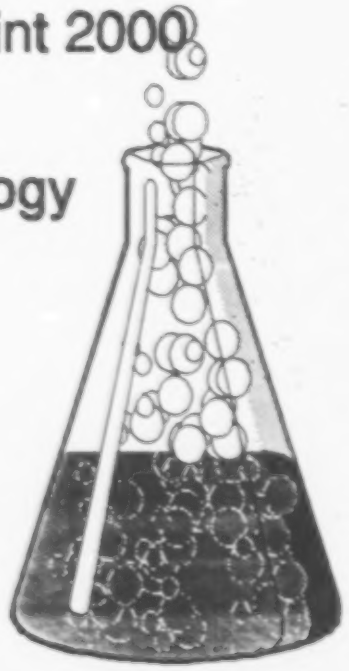
III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

Please note that the courses listed in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when combined with a corresponding course listed under TECHNOLOGY APPLICATIONS III. Tech-Prep 2 + 2 programs require articulation agreements between secondary and post-secondary educational agencies.

JOINT TECHNOLOGY EDUCATION/ SCIENCE LABORATORIES

- Develop shared-use facilities for joint teaching of science and technology education.
- Innovative instructional settings for Blueprint 2000 initiatives.
- Integration of scientific theory and technology application.

1993-94 Appropriated Funds		1994-95 Appropriated Funds
Equipment	Facility	10,000,000
10,800,000	25,000,000	



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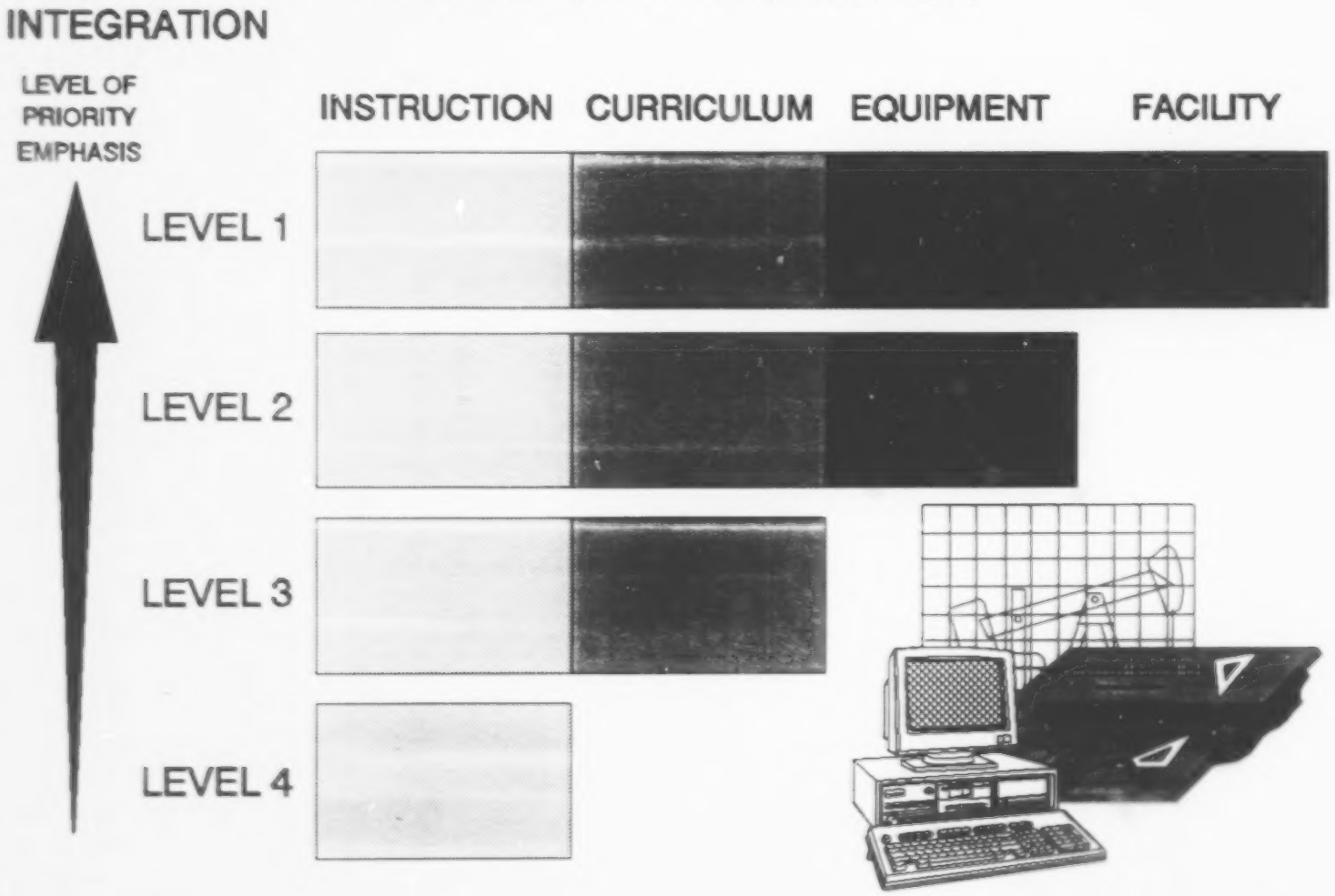
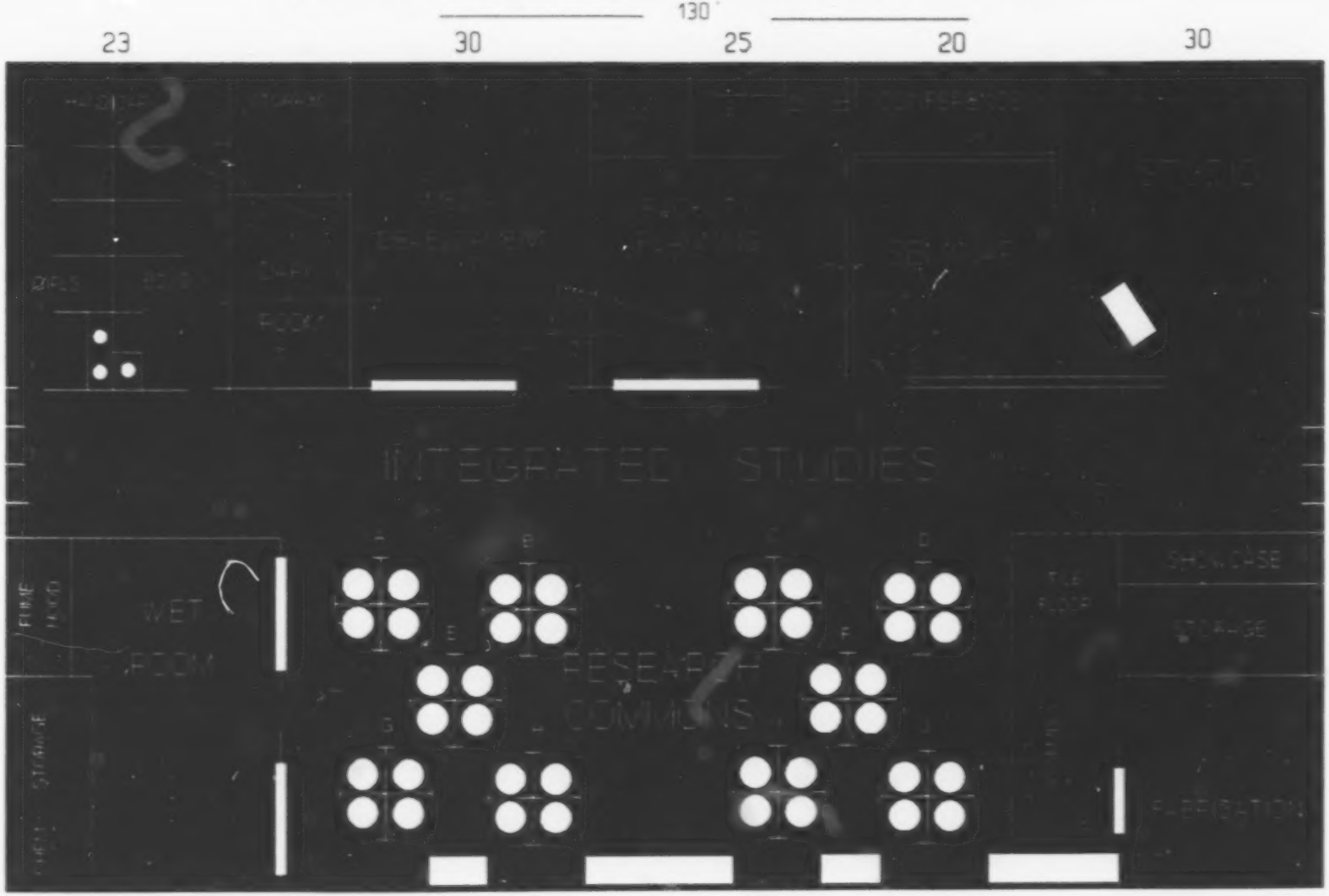
LEVEL OF INTEGRATION



SUGGESTED FACILITY FOR INTEGRATED STUDIES IN TECHNOLOGY AND SCIENCE



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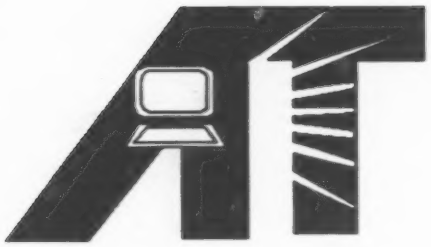
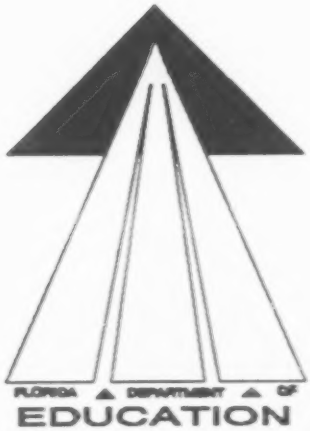


For further information contact:

William D. Wargo
Bob Caldwell
904/488-0400
Rm. 243, Collins Building
Bureau of Career Development & Educational Improvement
Division of Applied Technology and Adult Education
Florida Department of Education
Tallahassee, Florida



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